

19 European Patent Office

11 Publication number: 0 657 219 A1

12

EUROPEAN PATENT APPLICATION

21 Registration number: 94402822.4

51 Int. Cl.<sup>6</sup>:B02C 18/14

22 Date of registration: Dec. 8, 1994

30	Priority: Dec. 9, 1993 FR 9314776	72	Inventor: Garralon, Pierre 1, place du Château Perdu F-95690 NESLES LA VALLEE (FR) Inventor: Garralon, Jean 172, rue de Paris F-95230 Saint-Leu-La-Fôret (FR)
43	Date of publication of application: June 14, 1995, Bulletin 95/24	74	Representative: Lhuillier, René et al Cabinet Lepeudry 52, avenue Daumesnil F-75012 Paris (FR)
84	Contracting states designated: BE DE ES GB IT		
71	Applicant: Garralon, Pierre 1, place du Château Perdu F-95690 NESLES LA VALLEE (FR)		
71	Applicant: Garralon, Jean 172, rue de Paris F-95230 Saint-Leu-La-Fôret (FR)		

54 Shredder for industrial waste.

57 The rotary cutting members are shaped knives (4) borne by teeth (3) mounted on a single splined shaft (2), which knives pass through slots provided in the bottom (7) of the casing, the said bottom having a W-shaped profile, the middle central part of which forms a rib (9) which covers the said splined shaft, deflectors (11) being attached between the said rib and the inclined walls (10) of the bottom of the casing, which together with the said walls define cells of pyramidal shape with the vertex pointing downwards.

Application to industrial waste shredders.

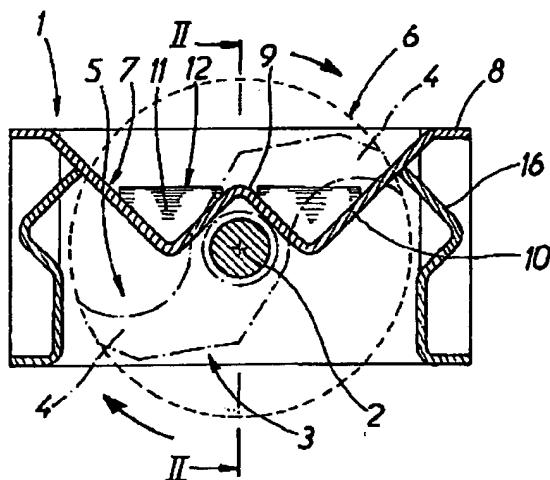


FIG. 1

The object of the invention is a shredder for industrial waste which is essentially composed of a shaft with cutting and shearing teeth associated with a receiving trough of a particular shape.

The known shredders intended to grind and reduce industrial waste are generally composed of two shafts bearing disks or knives which turn while intersecting in such a way as to chop and cut the waste deposited on these shafts. To be effective, the teeth of neighboring knives must be as close to each other as possible, and thus distributed in large numbers on each shaft. This then entails powerful geared drive motors, and the cost of the assembly is obviously high.

In order to achieve simplification without harming the shredding quality obtained, the Applicants have developed a single-shaft shredder, which is simple to make and use and thus is inexpensive. It also yields excellent results in that it breaks the product before shearing it, which makes the shredder especially suited for the treatment of plastic materials.

A principal object of the invention thus consists of a shredder for industrial waste using rotary cutting members distributed on a drive shaft mounted in a waste-collection casing, in which shredder the cutting members are shaped knives borne by teeth mounted on a single splined shaft, and which pass through slots provided in the casing, the bottom of said casing having a particular shape defining cells of pyramidal shape with the vertex pointing downwards, in which the said slots are cut.

According to a particular characteristic of the invention, the bottom is composed of a sheet with a cross-section in the shape of a W, the middle central part of which forms a rib which covers the splined shaft, and deflectors looking like hats, attached between the said rib and the inclined walls of the casing.

Advantageously, the upper edges of each deflector extend transversally on either side of the central rib and are found at the same level.

Other particular characteristics and advantages of the invention shall emerge from the following description of a non-restrictive example of realization which refers to the attached drawings which illustrate.

Figure 1 a transversal cross-section of the shredder.

Figure 2 a view according to II-II in figure 1.

Figure 3 a top view of the shredder.

The shredder illustrated on the figures has the general form of a rectangular casing 1 open at the upper portion, which is crossed by a single horizontal splined shaft 2 bearing shaped teeth 3. In figure 1 it can be seen more specifically that each tooth ends in two shaped knives 4 symmetrical with respect to the shaft, the face of which knives oriented in their direction of rotation forms a rounded surface 5. The range of movement of the two-knife wheel is delimited by the circle 6. The bottom 7 of the casing 1 has a very particular shape also visible in figure 3. Thus, from one longitudinal edge 8 to the opposite longitudinal edge of the casing, the bottom 7 is composed of a sheet with a cross-section in the shape of a W, the middle central part of which forms a rib 9 which covers the splined shaft 2, and of which the two lateral inclined walls 10 go up to the longitudinal edges. In the two grooves arranged between the said rib 9 and the walls 10 are deflectors 11 in the shape of a pyramid or a hat, of which the upper edge 12 extends transversally to the grooves, at the same level as that of the central rib 9. At each extremity of the grooves are attached triangular plates 13 inclined in the direction of the transversal edges of the casing, and up to a height also equivalent to that of the rib.

The bottom 7 of the casing with these deflectors 11 and the plates 13 define cells 14 in the shape of a pyramid whose vertex points downward. The walls of the bottom 7 in the center of each pair of cells 14, on either side of the central rib 9, are cut by a slot 15 for the passage of the teeth 3. In figure 1 we can see that the slot extends on the lateral walls 10 only up to a height corresponding to the range of motion 6 of the knife. Under the bottom 7 thus described are attached vertical shaped walls 16 which support and reinforce it.

The products to be shredded are thus placed in this casing and are positioned on the bottom 7, essentially supported by the upper edges 12 of the deflectors 11, as well as on the central rib 9 at the same level. During the rotation of the teeth 3 driven by the shaft 2, the knives 4 will break the waste before shearing it. This takes place at the time of the impact of the rounded surface 5 on the product before the knives penetrate the slot 15. In figure 1 it can be seen that the teeth 4 penetrate the inside of the upper extremity of the slot located roughly at the meeting point of the vertical walls 16 and the inclined wall 10. This zone is thus rigidified by this junction and can support the local constraints due to the shearing of the products between the edges of the slot and the teeth. For this purpose, the edges in question can also be provided with steel reinforcements. The rounded shape 5 of the teeth favors the cutting of waste along the rims.

The teeth 3 being attached to a splined shaft, they may be oriented parallel to each other or, on the contrary, angularly spaced. This assembly is easy and the choice is dictated by the nature of the products to be treated. The teeth with two branches, as described, may also be replaced by teeth with several branches.

The shredder according to the invention may be used alone or superimposed on at least one granulation drum. In this case, it constitutes the upper level of a complete shredder.

### Claims

1.- Shredder for industrial waste using cutting members distributed over a drive shaft mounted in a waste-collection casing, characterized in that the cutting members are shaped knives (4) borne by teeth (3) mounted on a single splined shaft (2), which cross slots (15) provided in the casing (1) and in that the bottom (7) of said casing has a particular shape defining cells (14) of pyramidal shape with the vertex pointing downwards, in which said slots are cut.

2.- Shredder according to claim 1, characterized in that the bottom (7) is composed of a sheet with a cross-section in the shape of a W, the middle central part of which forms a rib (9) which covers the splined shaft (2) and deflectors (11) which look like hats between said rib and the inclined walls (1) of the bottom of the casing.

3.- Shredder according to claim 2, characterized in that the upper edges (12) of each deflector (11) extend transversally on either side of the central rib (9) and are found at the same level.

4.- Shredder according to claims 2 and 3, characterized in that inclined triangular plates (13) are attached between the transversal edges of the casing up to a height equivalent to that of the rib (9).

5.- Shredder according to claim 1, characterized in that under the bottom (7) of the casing are attached profiled vertical walls (16) which support and reinforce it.

6.- Shredder according to claim 1, characterized in that the face of the knives (4), oriented in their direction of rotation, forms a rounded surface (5).

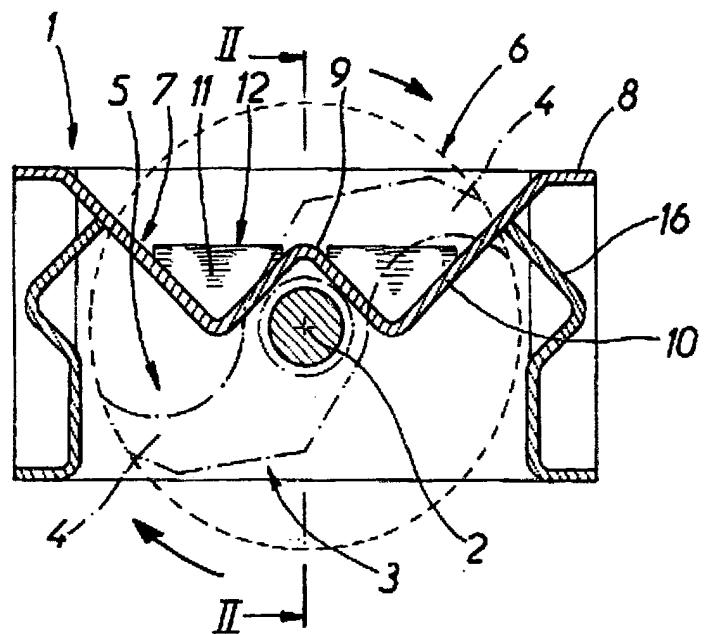


FIG. 1

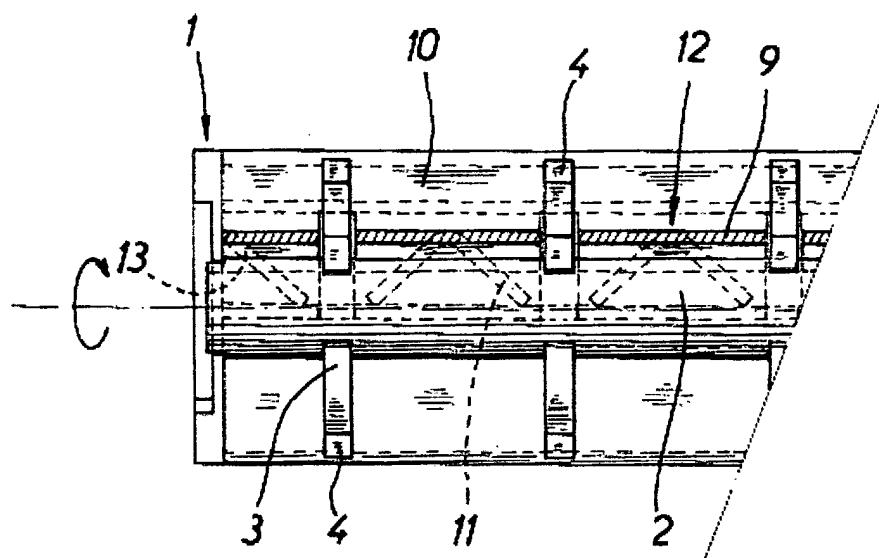
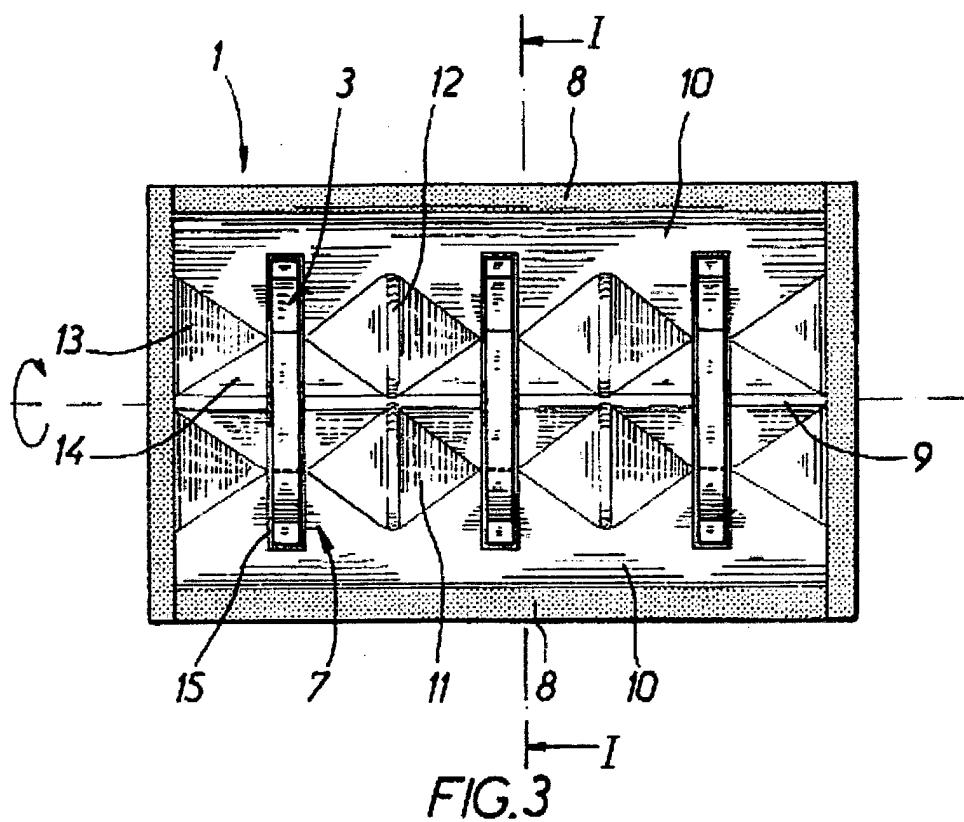


FIG. 2



European Patent Office

## EUROPEAN SEARCH REPORT

Application number  
EP 94 40 2822

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int.Cl.6)		
Category	Document citation indicating the relevant portions, if necessary	Claim concerned			
A	FR-A-2 691 079 (GARRALON P. & J.) * abstract; figure 1 *	1	B02C18/14		
A	DE-U-86 28 239 (W. SCHMITZ) * page 3 – page 4 – figures 1-3 *	1, 6			
A	EP-A-0-523 690 (SHOJI NAKAGOMI) * abstract; figure 2 *	1			
			TECHNICAL DOMAINS RESEARCHED (Int.Cl.6)		
			B02C		
This report was prepared for all claims					
Search location	Date search completed	Examiner			
THE HAGUE	March 16, 1995	Verdonck, J.			
CATEGORY OF DOCUMENTS CITED	T: theory or principal underlying the invention E: prior patent document, but published at the date of application or after this date D: cited in the request L: cited for other reasons ..... &: member of the same family, corresponding document				
X: particularly relevant in itself					
Y: particularly relevant in combination with another document of the same category					
A: technological background					
O: non-written disclosure					
P: intercalary document					